# Evaluation and Rating of Significant Transportation Projects in NoVA

## Project Evaluation Framework

Northern Virginia Transportation Authority
February 20, 2013

# Presentation Overview

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# Project Evaluation Framework Purpose

- **Ensure the project analysis and rating process is consistent with the overall intent of the law for this study**
  - ***Evaluate and rate significant transportation projects that reduce congestion and improve mobility during homeland security emergency situations***
  - ***Use transportation models and computer simulations to provide an objective, quantitative rating of significant transportation projects…***
- **Define and document the performance measures that will be used in the evaluation and how these measures will be used to rate the projects**

# Stakeholder Engagement

- December 19th Peer Review Group webinar
- December 27th distributed draft Project Evaluation Framework
- January 6th stakeholder dialogue on the draft performance measures and evaluation framework
- Stakeholder comments integrated into the final Project Evaluation Framework on January 30th
- January 31st stakeholder input session on the final project performance measures
- February 8th distributed maps of 2020 baseline conditions for input to the project selection process

# Project Evaluation Framework

- Projects will be evaluated and rated based on how well they reduce congestion and improve mobility during emergencies
  - The change in performance measures will be calculated for each project using the TPB regional demand model and TRANSIMS simulation software
- The performance measure weights developed through the stakeholder engagement process will determine the relative importance of each performance measure
- A weighted congestion reduction or mobility improvement score will be assigned to each performance measure for each project
- The sum of the weighted score of all of the performance measures will constitute the project's congestion reduction / mobility improvement rating

# Performance Measure Summary

- **Transit Crowding** = reduction in the number of transit route miles experiencing crowded conditions (local bus > 1.0; express bus and commuter rail > 0.9; Metrorail > 100 passengers/car).
- **Congestion Duration** = reduction in the number of hours of the day auto and transit passengers experience heavily congested travel conditions.
- **Person Hours of Delay** = reduction in the number of person hours of travel time above free flow travel time.
- **Person Hours of Congested Travel in Automobiles** = reduction in the number of person hours of travel in automobiles and trucks on heavily congested facilities.
- **Person Hours of Congested Travel in Transit Vehicles** = reduction in the number of person hours of travel in buses and trains on heavily congested facilities or in crowded vehicles.
- **Accessibility to Jobs** = increase in the number of jobs that can be reached from each household based on a 45 minute travel time by automobile and a 60 minute travel time by transit.
- **Emergency Mobility** = increase in the person hours of travel time resulting from a 10 percent increase in peak hour trip making.

# Weighting Performance Measures

| Performance Measure | Near-term Benefits (2020) | Long-term Benefits (2040) |
|---|---|---|
| | Attribute Weights[1] | Attribute Weights[1] |
| Transit Crowding | A% | A% |
| Congestion Duration | B% | B% |
| Person Hours of Delay | C% | C% |
| Person Hours of Congested Travel in Automobiles | D% | D% |
| Person Hours of Congested Travel in Transit Vehicles | E% | E% |
| Accessibility to Jobs | F% | F% |
| Emergency Mobility | G% | G% |
| **Total Attribute Weights** | 100% | 100% |

1. Attribute weights will be determined through a stakeholder consensus building process

# Stakeholder Input Session

- **On January 31st, 15 of 18 stakeholder jurisdictions and agencies participated in a session assessing the relative importance of the 7 performance measures in the Project Evaluation Framework**
  - Fairfax County
  - Prince William County
  - Arlington County
  - Loudoun County
  - City of Alexandria
  - City of Manassas
  - City of Fairfax
  - City of Falls Church
  - Town of Leesburg
  - Town of Herndon
  - Town of Dumfries
  - Washington Metropolitan Area Transit Authority (WMATA)
  - Virginia Railway Express (VRE)
  - Potomac and Rappahannock Transportation Commission (PRTC)
  - Northern Virginia Transportation Commission (NVTC)
- **Towns of Vienna and Purcellville and the City of Manassas Park were unable to participate**

# Using Stakeholder Input

- **Population / Ridership Weights**
  - Input of the jurisdictional representatives is weighted by the jurisdiction's population
  - Input of the transit agency representatives is weighted by the annual ridership of the service providers they represent
  - Transit agency inputs accounts for 18.4% of the combined inputs – based on the peak period transit mode share from the TPB model
- **NVTA Voting Rule**
  - Equal inputs of the voting members (four counties and five cities)
  - Considers the voting process as enunciated in the NVTA Bylaws
- **Blended Weights**
  - Average the Population / Ridership Weights with the NVTA Voting Rule

# Blended Performance Measure Weights

| Category-Attribute | | Blended Weights | | |
|---|---|---|---|---|
| | | Category | Attribute | Overall |
| Congestion Reduction | | 86.9% | | |
| | Transit Crowding | | 13.3% | 11.5% |
| | Congestion Duration | | 32.1% | 27.9% |
| | Person Hours of Delay | | 23.3% | 20.3% |
| | Person Hours of Congested Travel in Automobiles | | 17.7% | 15.4% |
| | Person Hours of Congested Travel in Transit | | 13.6% | 11.8% |
| | | | 100.0% | 86.9% |
| Improved Mobility | | 13.1% | | |
| | Accessibility to Jobs | | 72.6% | 9.5% |
| | Emergency Mobility | | 27.4% | 3.6% |
| | | | 100.0% | 13.1% |
| Total | | 100.0% | | 100.0% |

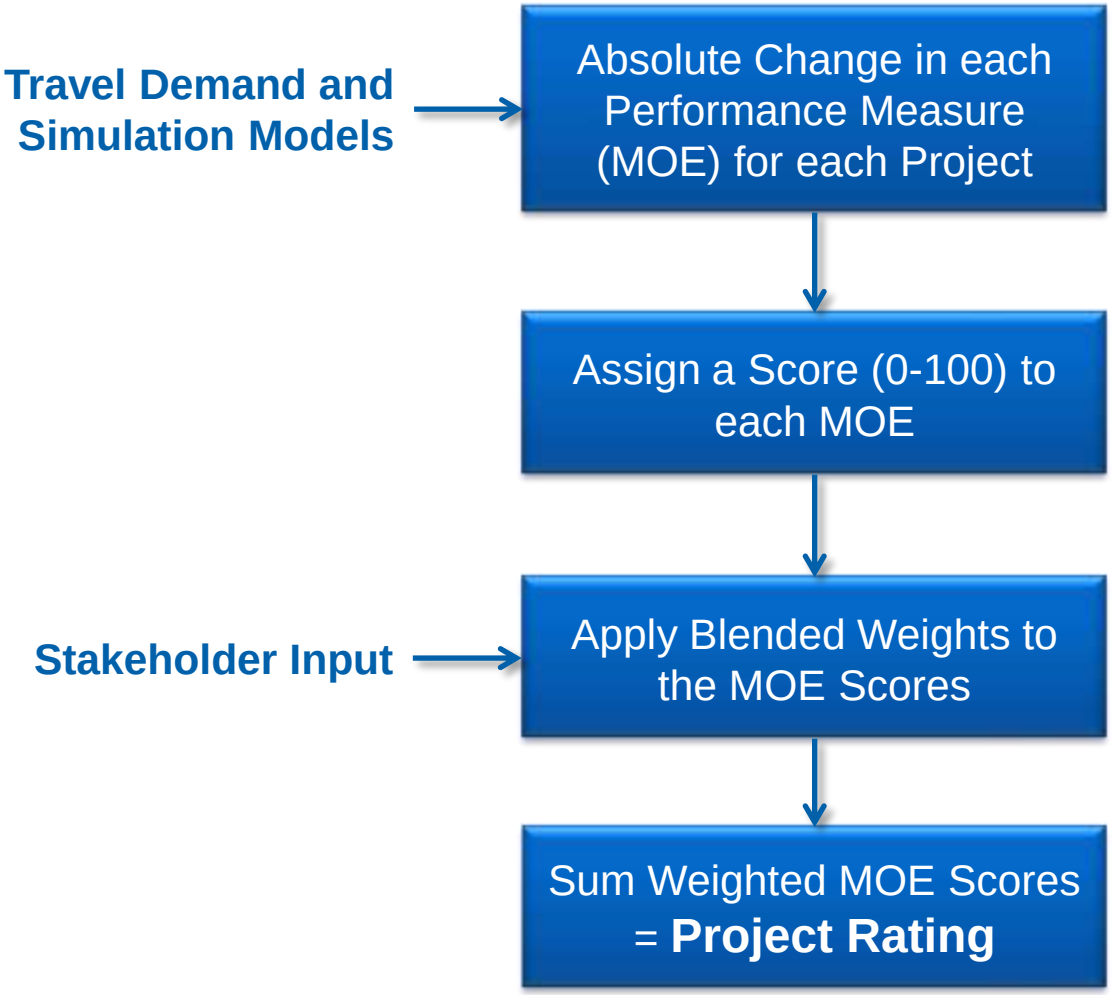
# Summary of Blended Weights

- **Blended Weights were selected for the Project Selection Model**
  - Consistent with CTB and NVTA outlooks
- **Blended Weights used for the Project Evaluation Framework**
  - Congestion Reduction accounts for 87% of the project rating score and Mobility Improvements account for 13%
  - The performance measures sorted by relative importance include:
    - Congestion Duration (28%)
    - Person Hours of Delay (20%)
    - Person Hours of Congested Travel in Automobiles (15%)
    - Person Hours of Congestion Travel in Transit Vehicles (12%)
    - Transit Crowding (12%)
    - Accessibility to Jobs (10%)
    - Emergency Mobility (4%)

# MOE Scores and Project Rating

- Model run for each project for 2020 and/or 2040 study years, and compared with baseline performance
- Calculate absolute change for each performance measure over the entire Northern Virginia District
- 100 points are awarded to the project that generates the greatest absolute change for each performance measure and analysis year
- The points for other projects are scaled based on how well it performs relative to the best performing project
- The performance measure (MOE) scores are multiplied by the blended stakeholder weights
- The sum of the weighted MOE scores will determine the project's congestion reduction / mobility rating for each analysis year

# Evaluation and Rating Process




Based on 100 points for the greatest absolute change in each MOE
(with and without the project)

# Project Evaluation Scores and Rating

| Performance Measure | Near-term Benefits (2020) | | Long-term Benefits (2040) | |
|---|---|---|---|---|
| | Attribute Weights[1] | Weighted MOE Score[2] | Attribute Weights[1] | Weighted MOE Score[2] |
| Transit Crowding | 11.5% | 11.5% * S11 | 11.5% | 11.5% * S21 |
| Congestion Duration | 27.9% | 27.9% * S12 | 27.9% | 27.9% * S22 |
| Person Hours of Delay | 20.3% | 20.3% * S13 | 20.3% | 20.3% * S23 |
| Person Hours of Congested Travel in Automobiles | 15.4% | 15.4% * S14 | 15.4% | 15.4% * S24 |
| Person Hours of Congested Travel in Transit Vehicles | 11.8% | 11.8% * S15 | 11.8% | 11.8% * S25 |
| Accessibility to Jobs | 9.5% | 9.5% * S16 | 9.5% | 9.5% * S26 |
| Emergency Mobility | 3.6% | 3.6% * S17 | 3.6% | 3.6% * S27 |
| **Congestion Reduction Rating** | 100% | 2020 Rating | 100% | 2040 Rating |

1. Attribute weights determined through the stakeholder consensus building process

2. S11-S27 represent the project performance score from the modeling process


*Questions / Comments*

# THANKS!

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